

SECTION XI

CONTROLLED UNCLASSIFIED INFORMATION

11.1. Except as otherwise provided in this Supplement or as authorized in writing by the originating Participant, Controlled Unclassified Information provided or generated pursuant to this Supplement will be controlled as follows:

- 11.1.1. Such information will be used only for the purposes authorized for use of Project Information as specified in Section X (Disclosure and Use of Project Information).
- 11.1.2. Access to such information will be limited to personnel whose access is necessary for the permitted use under subparagraph 11.1.1, and will be subject to the provisions of Section XIV (Third Party Sales and Transfers).
- 11.1.3. Each Participant will take all lawful steps, which may include national classification, available to it to keep such information free from further disclosure (including requests under any legislative provisions), except as provided in subparagraph 11.1.2, unless the originating Participant consents to such disclosure. In the event of unauthorized disclosure, or if it becomes probable that the information may have to be further disclosed under any legislative provision, immediate notification will be given to the originating Participant.

11.2. To assist in providing the appropriate controls, the originating Participant will ensure that Controlled Unclassified Information is appropriately marked. The Participants will decide, in advance and in writing, on the markings to be placed on the Controlled Unclassified Information. The appropriate markings will be defined in the MLRS Project Security Instruction.

11.3. Controlled Unclassified Information provided or generated pursuant to this Supplement will be handled in a manner that ensures control as provided for in paragraph 11.1.

11.4. Prior to authorizing the release of Controlled Unclassified Information to Contractors, the Participants will ensure the Contractors are legally bound to control such information in accordance with the provisions of this Section.

SECTION XII

VISITS TO ESTABLISHMENTS

12.1. Each Participant will permit visits to its government establishments, agencies and laboratories, and Contractor industrial facilities by employees of the other Participants or by employees of the other Participants' Contractor(s), provided that both the hosting and originating Participants authorize the visit and the employees have any necessary and appropriate security clearances and a need-to-know.

12.2. All visiting personnel will be required to comply with security regulations of the hosting Participant. Any information disclosed or made available to visitors will be treated as if supplied to the Participant sponsoring the visiting personnel, and will be subject to the provisions of this Supplement.

12.3. Requests for visits by personnel of one Participant to a facility of another Participant will be coordinated through the PMO, and will conform with the established visit procedures of the host country. After approval in principle, a formal visit request forwarding the required certificate of security clearances will be transmitted to the host Participant. Requests for visits will bear the name of the Production and Support Phase.

12.4. Lists of personnel of each Participant required to visit, on a continuing basis, facilities of the other Participant will be submitted through official channels in accordance with recurring international visit procedures.

SECTION XIII

SECURITY

13.1. All Classified Information exchanged or generated in connection with this Supplement will be used, transmitted, stored, handled, and safeguarded in accordance with the Participants' applicable national security laws and regulations; to the extent that they provide a degree of protection no less stringent than that provided for NATO classified information as set forth in the document "Security Within the North Atlantic Treaty Organisation", C-M-2002 (49), and its subsequent amendments. Additionally all Classified Information exchanged or generated in connection with this Production and Support Phase will be protected in accordance with the current issue of the jointly approved "Security Classification Guide" for the Multiple Launch Rocket System.

13.2. Classified Information will be transferred only through government-to-government channels or through channels approved by the National Security Authorities (NSAs)/Designated Security Authorities (DSAs) of the Participants. Such information will bear the level of classification, denote the country of origin, the provisions of release, and the fact that the information relates to the Production and Support Phase.

13.3. Each Participant will take all lawful steps available to it to ensure that Classified Information provided or generated pursuant to this Production and Support Phase is protected from further disclosure, except as permitted below, unless the other Participants consent to such disclosure.

Accordingly, each Participant will ensure that:

13.3.1. The recipients will not release the Classified Information to any government, national organization or other entity of a Third Party without the prior written consent of the originating Participant in accordance with the procedures set forth in Section XIV (Third Party Sales and Transfers);

13.3.2. The recipients will not use the Classified Information for other than the purposes provided for in this Supplement; and

13.3.3. The recipient will comply with any distribution and access restrictions on information that is provided under this Supplement.

13.4. The Participants will investigate all cases in which it is known or where there are grounds for suspecting that Classified Information provided or generated pursuant to this Supplement has been lost or disclosed to unauthorized persons. Each Participant also will promptly and fully inform the other Participants of the details of any such occurrences, and of the final results of the investigation and of the corrective action taken to preclude recurrences.

13.5. The NSA/DSA of the country in which a classified contract is awarded will assume responsibility for administering within its territory security measures for the protection of the Classified Information, in accordance with its laws and regulations. Prior to the release to a contractor, prospective contractor, or subcontractor of any Classified Information received under this Supplement, the NSAs/DSAs will:

13.5.1. Ensure that such Contractors, prospective contractors, or subcontractors and their facilities have the capability to protect the information adequately;

13.5.2. Grant a security clearance to the facilities, if appropriate;

13.5.3. Grant a security clearance for all personnel whose duties require access to Classified Information, if appropriate;

13.5.4. Ensure that all persons having access to the Classified Information are informed of their responsibilities to protect the information in accordance with national security laws and regulations, and the provisions of this Supplement;

13.5.5. Carry out periodic security inspections of cleared facilities to ensure that the Classified Information is properly protected; and

13.5.6. Ensure that access to the Classified Information is limited to those persons who have a need-to-know for purposes of this Production and Support Phase.

13.6. Contractors, prospective contractors, or subcontractors which are determined by the NSAs/DSAs to be under financial, administrative, policy or management control of nationals or entities of a Third Party may participate in a contract or subcontract requiring access to Classified Information provided or generated pursuant to this Production and Support Phase only when enforceable measures are in effect to ensure that nationals or entities of a Third Party shall not have access to Classified Information. If enforceable measures are not in effect to preclude access by nationals or other entities of a Third Party, the other Participants will be consulted for approval prior to permitting such access.

13.7. For any facility wherein Classified Information is to be used, the responsible Participant or Contractor will approve the appointment of a person or persons of sufficient rank to exercise effectively the responsibilities for safeguarding at such facility the information pertaining to the Production and Support Phase. These officials will be responsible for limiting access to Classified Information involved in this Production and

Support Phase to those persons who have been properly approved for access and have a need-to-know.

13.8. Each Participant will ensure that access to Classified Information is limited to those persons who possess requisite security clearances and have a specific need for access to the Classified Information in order to participate in the Production and Support Phase.

13.9. Participants will prepare a Project Security Instruction and review and provide any additions to the existing MLRS Security Classification Guide within three months of the effective date of this Supplement. The Project Security Instruction and Classification Guide will be forwarded to each Participant's DSA for approval. Upon approval, the Project Security Instruction and Classification Guide will be applicable to all government and Contractor personnel participating in the Production and Support Phase and subject to regular review and revision.

13.10. Information or material provided or generated pursuant to this Production and Support Phase may be classified as high as SECRET and equivalent national classification levels. The existence of this Supplement is unclassified and the contents are unclassified.

13.11. All Classified Information exchanged or generated under this Supplement will continue to be protected in the event of withdrawal by any Participant or upon termination of this Supplement.

SECTION XIV

THIRD PARTY SALES AND TRANSFERS

14.1. The Participants will not sell, transfer title to, disclose, or transfer possession of Project Foreground Information, jointly acquired or produced GMLRS items, or any GMLRS item that was jointly developed by the Participants to any Third Party without the prior written consent of the other Participants. Furthermore, no Participant will permit any such sale, disclosure, or transfer, including by the owner of the item, without the prior written consent of the other Participants. Such consent will not be given unless the government of the intended recipient agrees in writing that it will:

14.1.1. Not retransfer, or permit the further transfer of, any item or information provided; and

14.1.2. Use, or permit the use of, the item or information provided only for the purposes specified by the Participants.

14.2. A Participant will not sell, transfer title to, disclose, or transfer possession of GMLRS Project Equipment or Project Background Information provided by another Participant to any Third Party without the prior written consent of the Participant which provided such equipment or information. The providing Participant will be solely responsible for authorizing such transfers and, as applicable, specifying the method and conditions for implementing such transfers.

SECTION XV

LIABILITY AND CLAIMS

15.1. For liability arising out of, or in connection with, activities carried out in the performance of official duty in the execution and for the benefit of the Project, the following provisions will apply.

15.2. With the exception of claims for loss of or damage to Project Equipment under Section IX (Project Equipment), each Participant waives all claims against the other Participants for injury to or death of its military or civilian personnel and for damage to or loss of its property (including jointly acquired property) caused by such personnel (not including Project Contractors) of the other Participants. If, however, such injury, death, damage or loss results from reckless acts or reckless omissions, willful misconduct or gross negligence by a Participant's personnel, the cost of any liability will be borne by that Participant alone.

15.3. Claims, other than contractual claims, not covered by paragraphs 15.1. and 15.2. (such as those relating to unauthorized use of intellectual property or claims made by third parties) will be dealt with by each Participant in accordance with its national laws and applicable international arrangements among the Participants.

15.4. In the case of damage caused to or by jointly acquired property of the Participants, where the cost of compensation for such damage is not recoverable from other persons, such cost will be borne by the Participants as stated outlined in Section VI (Financial Arrangements) of this Supplement.

15.5. Claims arising under any Contract awarded pursuant to Section VII (Contracting Provisions) will be resolved in accordance with the provisions of the Contract. The Participants will not indemnify Contractors against liability claims by any other persons. However, in exceptional circumstances (e.g., involving certain nuclear activity or other unduly hazardous activity where the cost of insurance is excessively high), the Participants may consider whether to indemnify Contractors against liability claims by any other persons.

SECTION XVI

PARTICIPATION OF ADDITIONAL NATIONS

16.1. It is recognized that other nations may wish to join the Production and Support Phase.

16.2. Unanimous consent of the Participants will be required to conduct discussions with potential additional nations. The Participants will discuss the arrangements under which another nation might join, including the furnishing of releasable Project Information for evaluation prior to joining. If the disclosure of Project Information is necessary to conduct discussions, such disclosure will be in accordance with Section X (Disclosure and Use of Project Information), Section XI (Controlled Unclassified Information) and Section XIV (Third Party Sales and Transfers).

16.3. The Participants will jointly formulate the provisions under which additional nations might join. The addition of new Participants to the Production and Support Phase will require amendment of this Supplement by the Participants.

SECTION XVII

TAXES, DUTIES AND OTHER CHARGES

17.1. Customs duties, import and export taxes, and similar charges will be administered in accordance with each Participant's respective laws and regulations. Insofar as existing national laws and regulations permit, the Participants will endeavor to ensure that such readily identifiable duties, taxes and similar charges, as well as quantitative or other restrictions on imports and exports, are not imposed in connection with work carried out under this Production and Support Phase.

17.2. Each Participant will use its best efforts to ensure that customs duties, import and export taxes, and similar charges are administered in a manner favorable to the efficient and economical conduct of the work. If any such duties, taxes, or similar charges are levied, the Participant in whose country they are levied will bear such costs.

17.3. If, in order to apply European Union (EU) regulations, it is necessary to levy duties, then these will be met by the EU member end recipient. To this end, parts or components of the equipment coming from outside of the EU will proceed to their final destination accompanied by the relevant customs document enabling settlement of duties to take place. They will be levied as a cost over and above the relevant Participant's shared cost of the Production and Support Phase.

SECTION XVIII

SETTLEMENT OF DISPUTES

18.1. Disputes between the Participants arising under or relating to this Supplement will be resolved only by consultation between the Participants and will not be referred to a national court, an international tribunal, or to any other person or entity for settlement.

SECTION XIX

LANGUAGE

19.1. The working language for the Production and Support Phase will be the English language.

19.2. All data and information generated under this Supplement and its implementing Contracts and provided by one Participant to the other Participants will be furnished in the English language.

SECTION XX

AMENDMENT, TERMINATION, ENTRY INTO EFFECT, AND DURATION

20.1. All activities of the Participants under this Production and Support Phase will be carried out in accordance with their national laws and regulations, including their export control laws and export control regulations. The responsibilities of the Participants will be subject to the availability of appropriated funds for such purposes.

20.2. Except as otherwise provided, this Supplement may be amended by unanimous written consent of the Participants. Annexes A and B of this Supplement may be amended by the written approval of the JSC.

20.3. This Supplement will be effective for the duration of the Basic MLRS MOU including any extensions jointly determined by the Participants.

20.4. The respective benefits and responsibilities of the Participants regarding Section IX (Project Equipment), Section X (Disclosure and Use of Project Information), Section XI (Controlled Unclassified Information), Section XIII (Security), Section XIV (Third Party Sales and Transfers), and Section XV (Liability and Claims), and this Section XX (Amendment, Termination, Entry into Effect, and Duration) will continue to apply notwithstanding termination or expiration of this Supplement.

20.5. If a Participant considers it necessary to discontinue its participation, the following provisions will apply:

- 20.5.1. The Participant desiring to discontinue its participation will notify the PC and the NPMs of the other Participants in writing of its intention to withdraw participation 180 days prior to such termination taking effect;
- 20.5.2. The Participants will evaluate fully the consequences of such withdrawal, including the possibility of continuation of the Production and Support Phase on a changed or modified basis. If the Participants jointly concur that such continuation is not practicable, the provisions of paragraph 20.6 below will apply;
- 20.5.3. The withdrawing Participant will continue its participation, financial and otherwise, until the effective date of withdrawal or completion of the Production and Support Phase, whichever occurs soonest;
- 20.5.4. At the request of the other Participants, the withdrawing Participant will take all necessary actions within its control to ensure that the remaining Participants can continue the Production and Support Phase; and

20.5.5. The withdrawing Participant will be liable for two types of costs:

20.5.5.1. Its share, in accordance with the cost share provision, of the common funded cost expended under this Production and Support Phase up to the effective date of withdrawal; and

20.5.5.2. All direct costs arising as a result of the withdrawal, including the costs of any contract termination or modification caused by the withdrawal; the Participants will endeavor to keep all direct costs of withdrawal as low as possible.

20.5.6. However, the total contribution by any withdrawing Participant, including withdrawal costs, will in no event exceed the amount the withdrawing Participant would have contributed had it remained in the Production and Support Phase.

20.6. In the event that the Participants jointly decide to terminate the Production and Support Phase, their responsibility will be to pay their share of the cost for the commitments then in force and any termination cost associated therewith. The Participants may enter into additional arrangements, satisfactory to all Participants, covering other conditions on which the Production and Support Phase will be terminated.

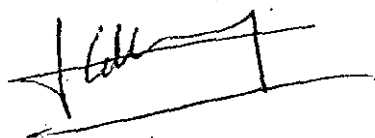
20.7 Amendment One to Supplement Number Five, which consists of twenty-one (21) Sections and three (3) Annexes, will enter into effect when it has been signed on behalf of all the Participants upon the date of the last signature.

SECTION XXI

SIGNATURES AND EFFECTIVE DATE

The foregoing represents the understandings reached between the Participants on the matters referred to herein.

Signed in five originals, in the English language by duly authorized representatives.



Place, Date

PARIS 21/09/2005

FOR THE MINISTER OF DEFENSE OF THE FRENCH REPUBLIC



Place, Date

Koblenz 13.09.05

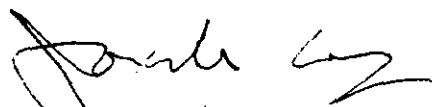
FOR THE FEDERAL MINISTRY OF DEFENCE OF THE FEDERAL REPUBLIC OF GERMANY



Place, Date

Roma 23.09.05

FOR THE MINISTRY OF DEFENCE OF THE ITALIAN REPUBLIC



Place, Date

Buckingham Palace 4.10.05

FOR THE SECRETARY OF STATE FOR DEFENCE OF THE UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND



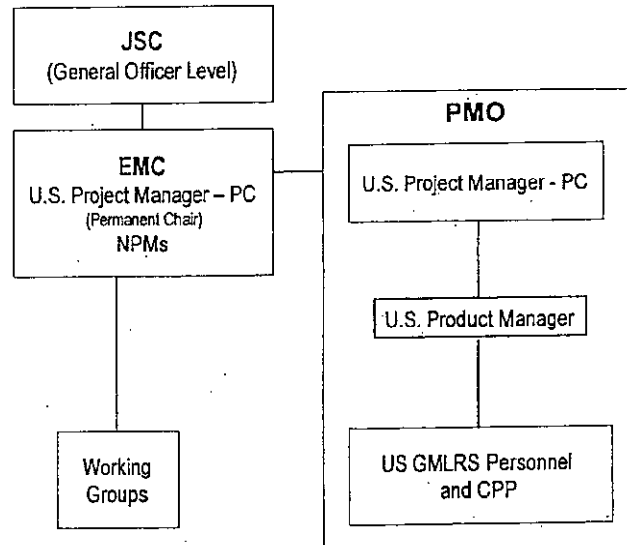
Place, Date

Washington, D.C.; August 31, 2005

FOR THE DEPARTMENT OF DEFENSE OF THE UNITED STATES OF AMERICA

ANNEX A

GMLRS Cooperative Production and Support Phase Management Structure



ANNEX B

COOPERATIVE PROJECT PERSONNEL

1.0. Purpose and Scope

1.1. This Annex establishes the provisions which will govern the conduct of Cooperative Project Personnel (CPP). The Parent Participant will assign military members or civilian employees to the PMO in accordance with Section V (Program Management), Annex A (Joint Project Office Organization) and this Annex. CPP must be able to perform all the responsibilities assigned to them under this Supplement. Commencement of assignments will be subject to any requirements that may be imposed by the Host Participant or its government regarding acceptance of CPP, such as, but not limited to, visas and visit request documentation. The PMO, in coordination with the respective NPM, will determine the length of tour for the positions at the time of initial assignment.

1.2. CPP will be assigned to the PMO for Project work and will report to their designated PMO supervisor regarding that work. The U.S. PM will be responsible for the creation of a document describing the duties of each CPP position, which will be subject to approval by the EMC. CPP will not act as liaison officers on behalf of the Parent Participant. CPP may act from time to time on behalf of their respective EMC member if the latter so authorizes in writing.

1.3. CPP will not be assigned to command or other positions that would require them to exercise responsibilities that are reserved by law or regulation to an officer or employee of the Host Participant's government.

2.0. Security

2.1. The EMC will establish the maximum level of security clearance required, if any, to permit CPP to have access to Classified Information and facilities in which Classified Information is used in accordance with the Project Security Instruction (PSI) and Classification Guide (CG). Access to Classified Information and facilities in which Classified Information is used will be consistent with, and limited by, Section III (Objectives) and Section IV (Scope of Work) of this MOU and will be kept to the minimum required to accomplish the work assignments.

2.2. The Parent Participant will file visit requests for the CPP through prescribed channels in compliance with the Host Participant's procedures. As part of the visit request procedures, the Parent Participant will cause security assurances to be filed, through the Parent Participant's government embassy in Washington DC specifying the security clearances for the CPP being assigned.

2.3. The Host Participant and Parent Participant will use their best efforts to ensure that CPP assigned to the PMO are aware of, and comply with, applicable laws and regulations as well as the requirements of Section XI (Controlled Unclassified Information), Section XII (Visits to Establishments), Section XIII (Security), and Section XX (Amendment, Termination, Entry into Effect, and Duration) of this Supplement and the provisions of the PSI and CG. Prior to commencing assigned duties, CPP will, if required by the Host Participant's government laws, regulations, policies, or procedures, sign a certification concerning the conditions and responsibilities of CPP.

2.4. CPP will at all times be required to comply with the security and export control laws, regulations, and procedures of the Host Participant's government. Any violation of security procedures by CPP during their assignment will be reported to the Parent Participant for appropriate action. CPP committing significant violations of security and export control laws, regulations, or procedures during their assignments will be withdrawn from the Project with a view toward appropriate administrative or disciplinary action by their Parent Participant.

2.5. All Classified Information made available to CPP will be considered as Classified Information furnished to the Parent Participant, and will be subject to all provisions and safeguards provided for in Section XIII (Security), the PSI, and CG.

2.6. CPP will not have personal custody of Classified Information or Controlled Unclassified Information unless approved by the Host Participant and as authorized by the Parent Participant. They will be granted access to such information in accordance with Section XI (Controlled Unclassified Information), Section XIII (Security), and the PSI during normal duty hours at the PMO and when access is necessary to perform Project work.

2.7. CPP assigned to the PMO will not serve as a conduit between the Host Participant and Parent Participant for requests and/or transmission of Classified Information or Controlled Unclassified Information unless specifically authorized by the PSI.

3.0. Technical and Administrative Matters

3.1. Consistent with Host Participant's government laws and regulations, CPP will be subject to the same restrictions, conditions, and privileges as Host Participant personnel of comparable rank and in comparable assignments. Further, to the extent authorized by Host Participant's government laws and regulations, CPP and their authorized dependents will be accorded:

3.1.1. Exemption from any Host Participant's government tax upon income received from the Parent Participant.

3.1.2. Exemption from any Host Participant's government customs and import duties or similar charges levied on items entering the country for their official or personal use, including their baggage, household effects, and private motor vehicles.

3.2. On arrival CPP and their dependents will be provided briefings arranged by the PMO about applicable laws, orders, regulations, and customs and the need to comply with them. CPP will also be provided briefings arranged by PMO regarding entitlements, privileges, and obligations such as:

- 3.2.1. Any medical and dental care that may be provided to CPP and their dependents at Host Participant medical facilities, subject to the requirements of applicable laws and regulations, including reimbursement requirements.
- 3.2.2. Purchasing and patronage privileges at military commissaries, exchanges, theaters, and clubs for CPP and their dependents, subject to the requirements of applicable laws and regulations.
- 3.2.3. The Host Participant will provide, if available, housing and messing facilities for CPP and their dependents on the same basis and priority as for its own personnel. CPP will pay messing and housing charges to the same extent as Host Participant personnel. At locations where facilities are not provided by the Host Participant for its own personnel, the Parent Participant will make suitable arrangements for its CPP.
- 3.2.4. Responsibility of CPP and their accompanying dependents to obtain motor vehicle liability insurance coverage in accordance with the laws and regulations applicable in the area where they are residing. In case of claims involving the use of private motor vehicles by CPP, the recourse will be against such insurance.

3.3. The PM, through the PMO, will, in consultation with the CPP, establish standard operating procedures for CPP, in the following areas:

- 3.3.1. Working hours, including holiday schedules.
- 3.3.2. Leave authorization, consistent to the extent possible with the military and civilian personnel regulations and practices of the Host Participant and Parent Participant.
- 3.3.3. Dress regulations, consistent to the extent possible with the military and civilian personnel regulations and practices of the Host Participant and Parent Participant.
- 3.3.4. Performance evaluations, recognizing that such evaluations will be rendered in accordance with the Parent Participant's military or civilian personnel regulations and practices.

3.4. CPP committing an offense under the laws of the government of the Host Participant or Parent Participant may be withdrawn from this Project with a view toward further

administrative or disciplinary action by the Parent Participant. Disciplinary action, however, will not be taken by the Host Participant against CPP, nor will the CPP exercise disciplinary powers over the Host Participant's personnel. In accordance with Host Participant's government laws and regulations, the Host Participant will assist the Parent Participant in carrying out investigations of offenses involving CPP.

3.5. During their PMO assignment, CPP will not be placed in the following duty status or environments unless jointly decided by the EMC:

- 3.5.1. Areas of political sensitivity where their presence may jeopardize the interests of either the Host Participant or Parent Participant, or where, in the normal course of their duty, they may become involved in activities which may embarrass either Participant;
- 3.5.2. Deployments in non-direct hostility situations, such as UN peacekeeping or multi-national operations, or third countries;
- 3.5.3. Duty assignments in which direct hostilities are likely. Should a PMO to which CPP are assigned become involved in hostilities unexpectedly, CPP assigned to that PMO will not be involved in the hostilities. Any such CPP approved by the EMC for involvement in hostilities will be given specific guidance as to the conditions under which the assignment will be carried out by the appropriate authorities of the Host Participant and Parent Participant.

ANNEX C

PROVISIONS

FOR THE PROCUREMENT OF NAVSTAR/GLOBAL POSITIONING SYSTEM (GPS) PRECISE POSITIONING SERVICE (PPS) HOST APPLICATION EQUIPMENT (HAE)

1. The European Participants are authorized to purchase GPS HAE that have a security design approved by the GPS Joint Program Office as "UNCLASSIFIED/Controlled" when keyed.
2. The European Participants will not use or permit the use of any GPS/PPS HAE or related technical data, computer software, or components thereof, in any complete rocket system (including ballistic missiles, space launch vehicles, and sounding rockets) and unmanned air vehicle system (including cruise missile systems, target drones and reconnaissance drones) capable of delivering a payload larger than 500kg beyond a range of 300km without the prior written consent of the United States Government.
3. The European Participants are not authorized to perform maintenance on GPS/PPS security devices (the PPS Security Module (PPS-SM), Auxiliary Output Chip (AOC, combined PPS-SM/AOC device, Selective Availability Anti-Spoofing Module (SAASM), or SAASM Code Block (SCB), equipment subassemblies containing GPS/PPS security devices, or related GPS/PPS software. If a malfunction of a GPS/PPS HAE is isolated to a subassembly containing a GPS/PPS security device, the faulty subassembly will be removed, replaced, and returned to the U.S. Government for repair. If any GPS/PPS security device or any subassembly containing a GPS/PPS Security device is no longer needed or wanted, it will be returned to the U.S. Government for destruction.
4. The European Participants will provide for the protection of GPS/PPS security devices from unauthorized access, theft, tampering, or loss.
5. The European Participants are responsible for accountability by quantity for GPS/PPS HAE purchased. The European Participants will account for the GPS/PPS HAE by performing equipment inventories at least annually and whenever there is a change in personnel responsible for GPS/PPS HAE. Any incident involving unauthorized access to, or tampering with, theft, or loss of, GPS/PPS HAE will be reported to the U.S. GPS Joint Program Office.
6. If a European Participant decides to discontinue use of GPS/PPS equipment, the conditions of this Annex will terminate with respect to GPS/PPS equipment and all GPS/PPS security devices will be returned to the U.S. Government.
7. This Supplement Five does not transfer GPS/PPS design or manufacturing information, to include cryptographic software technology.